

Name: _____

Date: _____

Part 1: Multiple Choice (2 points each)

1. Here are the means and standard deviations of the weights of two groups of cats.

Group	\bar{y} (lbs)	s_y (lbs)
A	7	1.2
B	5	1.7

Which statement is true?

- All the cats in group B weigh less than all the cats in group A.
 - The weights of each group follow a Normal model.
 - A 3.3 pound cat in group B is closer to average than an 8.2 pound cat in group A.
 - Compared to group B, the weights in group A are closer to the mean.
2. In a Normal model, what percent of data is between -1 and +2 standard deviations of the mean?
- 68
 - 95
 - 99.7
 - It depends upon the standard deviation
3. Normal model A has a smaller standard deviation than Normal model B. How do the graphs of these models compare when drawn on the same scale?
- Model A is flatter and wider than Model B.
 - Model A is taller and narrower than Model B.
 - Model A is flatter and narrower than Model B.
 - Models A and B look exactly the same.
4. Which of the following variables would most likely follow a Normal model?
- Wingspan of monarch butterflies.
 - Family income
 - Weights of adult male elephants
 - The last digit of US street address numbers
5. Suppose that a Normal model describes the number of pages printer ink cartridges last. A certain cartridge has a standardized score (z-score) of 0.2. what does this mean regarding the cartridge?
- It produced 20% more pages than the average cartridge.
 - It produced 0.2 more pages than the average cartridge.
 - It produced a number of pages equal to 0.2 standard deviations.
 - It produced 0.2 standard deviations pages more than average.

Statistics

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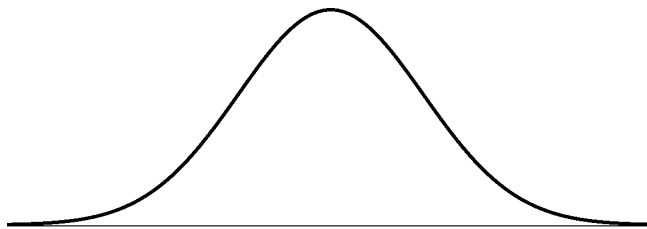
6. We collect these data from 50 male students. Which variable is most likely to follow a Normal model?
- Eye color
 - Head circumference
 - Hours of homework last week
 - Number of cigarettes smoked daily
 - Number of TV sets at home

Part 2: Short Answer

7. Adult female Dalmatians weigh an average of 50 pounds with a standard deviation of 3.3 pounds. Adult female Boxers weigh an average of 57.5 pounds with a standard deviation of 1.7 pounds. At the animal shelter are a female Dalmatian weighing 45 pounds and a female Boxer weighing 52 pounds. Which dog is more underweight?. (4pts)

8. Justify your answer from #7 in words. (3pts)

9. Assume human body temperatures taken via the ear follow a Normal model with a mean of 98.7°F and a standard deviation of 0.7° . Draw and clearly label this model showing the mean, ± 1 , ± 2 , and ± 3 standard deviations, and the percentage of people in those ranges. (5pts)



10. What percent of people have ear temperatures that are _____
1 or more standard deviations greater than the mean? (2pts)

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11. What percent of people have ear temperatures that are _____
1 or more degrees greater than the mean? (2pts)

12. An ear temperature of 97°F or less may indicate _____
hypothermia (low body temperature). What percent
of people have ear temperatures that may indicate
hypothermia? (1pt)

13. Use statistics to explain your answer to question #12. (3pts)

14. What are the ear temperatures of the lowest-scoring _____
2.5% of the population? (2pts)

15. What percent of people have temperatures greater than _____
100°? (3pts)

16. Find the third quartile (75th percentile) for temperatures. _____
(3pts)

17. You take your ear temperature and find it to be 97.9°F. Is your temperature
unusual compared to what is described by the Normal model? Explain. (4ts)

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A roadway construction process uses a machine that pours concrete onto the roadway and measures the thickness of the concrete so the roadway will measure up to the required depth in inches. The concrete thickness needs to be consistent across the road, but the machine isn't perfect and it is costly to operate. Since there's a safety hazard if the roadway is thinner than the minimum 23-inch thickness, the company sets the machine to average 26 inches for the batches of concrete. They believe the thickness level of the machine's concrete output can be described by a Normal model with standard deviation 1.75 inches.

18. What percent of the concrete roadway is under the minimum depth? (5pts)

19. Explain what achieving a smaller standard deviation means in this context. (4pts)
